

NOVA NOTES

VOLUME 29 — NUMBER 4 — AUGUST 1998

THE NEWSLETTER OF THE HALIFAX CENTRE OF THE RASC

PO BOX 31011, HALIFAX, NS, CANADA B3K 5T9

Website: <http://halifax.rasc.ca> E-mail: halifax@rasc.ca



INSIDE THIS ISSUE...

Editor's Report	1
President's corner	1
March Meeting Report	2
June Meeting Report	2
MaxIm DL Software Review	3
- Blair McDonald	
Solar Flare Alert!	4
- Heather Cameron	
What's Up	5
- Mike Boschat	
Notice of Meetings and Other Stuff	6

EDITOR'S REPORT: BY SHAWN MITCHELL

A very eventful summer has come to an end. Nova East '98 was considered a great success by all who attended, we held several work parties at St. Croix including a few well attended observing sessions.

Work to prepare St. Croix for winter observing will be starting in a couple of weeks. We plan to finish painting the inside of the warm room and installing the heater. The solar panels are also ready to be placed on the roof of the warm room to provide star power for our evenings at the eyepiece. Only a couple of small projects remain to be done to complete this phase of the building of the observatory.

Now that the summer is over and everyone is starting to get back into their routines, the



ASTROPHOTO OF THE MONTH — MARE NECTAR

The photo was taken with a QuickCam digital camera at prime focus on a Celestron 8" SCT by Mike Bochat. To see some other great shots done with a QuickCam see Mike's web page at: www.atm.dal.ca/~andromed/

editor needs new articles for future issues of Nova Notes. So sit down in front of your keyboards or pick up a pen and write about your summer astronomical adventures. Ω

PRESIDENT'S CORNER: BY CLINT SHANNON

I am happy to report that Nova East '98 was considered by all who attended to be a great success. The success of any function does not happen by

accident, so in addition to having acceptable astronomy weather the individuals whose efforts played key parts were: Co-Chairs Dave Lane & John Jarvo Public Speakers Mary Lou Whitehorne & Pat Kelly Door Prizes arranged by Bill Thurlow Cookout Chef Dave Chapman Public Parking Guides Shawn Mitchell & Pat Kelly. Public solar observing by: Dave Chapman, Shawn Mitchell and yours truly.

In addition to approximately 40 registrants, plus family and

friends. It was estimated that there



NOVA NOTES, the newsletter of the *Halifax Centre of the Royal Astronomical Society of Canada*, is published bi-monthly in February, April, June, August, October, and December. The opinions expressed herein are not necessarily those of the *Halifax Centre*. Material for the next issue should reach the editor by **April 17th, 1998**. Articles on any aspect of astronomy will be considered for publication. "Letters to the Editor" or to our resident expert: GAZER are also most welcome. Contact the editor at:

Shawn Mitchell

94 Alder Crescent
Lower Sackville, NS
B4C 1A2

E-mail: smitchell@ap.stmarys.ca
Phone: (902) 865-7026 (home)
(902) 420-5833 (work)

were about 70 people at Nova East this year. Friday night was cloudy during the evening but cleared at 1:00 AM. (Editors note: 5 minutes after stepping out of a well-lighted room I had an LVM of 5.8, not bad for no dark adaptation). We were blessed with good skies on Saturday night

although dew was a problem for some (Editors note: Dam Schmidt's). We were host to approximately 250 people for the public observing. On Sunday morning we were able to give about 75 people their first look at our nearest star Sol. Sunday night it clouded over at dusk so our scopes were packed away for the return trip home.

I enjoyed a fantastic view of Jupiter with two jovian moon shadow crossings through Roy Bishop's Zeis Bino Viewer which was attached to Tony Jones' Astro Physics refractor. Also on Saturday there were some great views of solar prominences through Roy's Lumicon filter on his Astro-Physics refractor and the SMU H-alfa filter on my 8" SCT.

Nova East '99 will be held on August 13-16 but we may start earlier on Thursday the 12th because that will be the peak of the Perseids. And of course,, the total solar eclipse expedition to the grand bands will be he on August 11th.

After having looked through Roy's newly acquired 15X45IS Canon Binoculars earlier this summer I was hooked, so I succumbed and purchased my own. To say the least they are impressive. There was a detailed report on them in the May '98 issue of Sky & Tel which says it all. Ω

MARCH MEETING REPRT: BY PAT KELLY

At 8:01:42 (approximately) our great, glorious and not a Dave leader Clint called the meeting to order. Now

just so everyone realizes, this is a new record for the start time of a meeting surpassing the previous record of 8:01:42.02565 (I asked Gazer!). After the usual welcome to the audience (and the unruly mob in the first row) Clint made his usual pitch for new members. As Clint continued with the opening remarks microphone trouble forced our former great, glorious and definitely a Dave ex-president (once removed) Mr. Lane to make hasty repairs (meeting reporter's note: he turned it on).

Our observing chairman Mike made an excellent what's up presentation, telling us about the upcoming occultation of Jupiter by the Moon (and other events that would also be clouded out).

Dave Lane then introduced the guest speaker Dr. Michael West who gave a wonderful talk on galaxy formation. Dr. West's hypotheses are that globular clusters can tell us much about the formation of a galaxy. It turns out that the cluster population varies with the hubble type of a galaxy and with its local environment. When a galaxy is massive and is located within a rich galaxy cluster, statistically it has a larger population of globulars. Dr. West's theory is that many of the globulars are extra-galactic and trace out the mass profile of the galaxy cluster. These along with some other arguments hint that the metal rich globulars may be the oldest not the youngest clusters. All in all, a fascinating theory that may, if it turns out to be correct, upset some standard theories on the

formation of galaxies and globulars.

The meeting adjourned at 9:25:32.02546 PM. approximately (I was told to be as accurate as possible) for the usual coffee and cookie social hour. Ω

JUNE MEETING REPORT: BY PAT KELLY

The attendance for this meeting was about average for other June meetings, with just over two dozen members in attendance. The meeting started off on a rather sad note, as Clint Shannon announced that our honorary president, Murray Cunningham, had died earlier in the month. (See the obituary elsewhere in this issue). Well over a dozen centre members were at his memorial service. Anyone who saw his obituary in the local papers would realize what a wide variety of interests he had, not to mention his many accomplishments. We should feel very honored that the centre's observatory fund was named as the recipient of memorial donations. It would appear that Murray's interest in astronomy reached much farther than Nova Scotia. Clint informed us that Murray's ashes will be placed aboard the next space shuttle. In Murray's honor, a minute of silence was observed.

"What's Up" with Mike Bosch was next. He reported on a number of upcoming conjunctions of the Moon with Aldebaran and several planets. The only problem is that they all occur in the morning sky. If you have been getting tired of waiting

for a planet to reappear in the evening sky, your wish will be granted later this month when Jupiter returns.

The meeting had three talks. The first speaker was Darryl DeWolfe who did a show-and-tell with his Maksutov-Newtonian telescope. Peter Ceravolo, the noted Canadian telescope maker manufactured it, and it is only the second of its kind. He gave a quick summary of the main types of telescopes and how the Maksutov-Newtonian compared with them.

In 1992, Peter Ceravolo was involved with a group that wanted to see the effect that mirror quality had on the performance of telescopes. They made four telescopes that were identical, except for the primary mirrors, which were of four different levels of quality. Sponsored by Sky Publishing, they took them to Stellafane and had attendees look through all of them and note the differences. As expected, the scopes with the superior optics performed better, but only when the atmospheric conditions were good with mediocre skies, there was little difference between the images.

As a result, Darryl's main goal in getting this scope was to have an instrument where the views would be limited, not by the optics, but by the sky. The telescope features a 6 inch f/6 Pyrex mirror. The main objective of the scope's design was to combine good optics with a reasonable price. It uses a helical focuser, which allows for the use of a much smaller secondary mirror. The secondary is attached

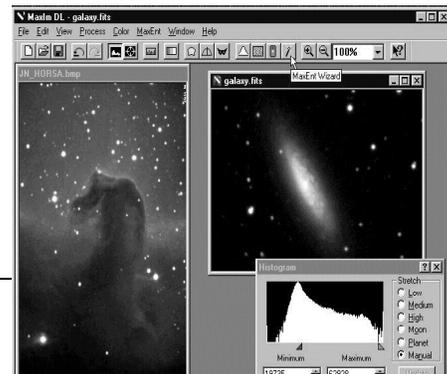
to the back of the corrector plate, so that there are no spider vanes to produce diffraction spikes. Another nice feature is that the primary and secondary mirrors, as well as the corrector, are all permanently collimated.

The tube has a mass of just over 11 kg which makes it very convenient to transport. The small mass also means that it cools quite quickly and it has never taken more than thirty minutes, which is very good for a sealed-tube design. He currently has it mounted on a homemade Dobsonian mount. Ω

MAXIM DL SOFTWARE REVIEW: BY BLAIR McDONALD

It isn't too often that I get to use a software package that works as advertised right out of the box. MaxIm DL is such a package. The package is chalk full of easy to use wizards and dialog boxes and a fair amount of thought have gone into the graphical user interface. The package greatly simplifies the Maximum Entropy processing and is not limited in image size.

The program offers the usual ability to apply kernel filters with several pre-defined filters such as high pass, low pass and several averaging filters. One nice touch is the ability to use FFT filters instead of convolution



The package offers several ways to combine images: addition, subtraction duplication and division are supported. There is also a very handy function for combining files with centering and rotation corrections. This is one of the few areas where the package could use some more functionality. One oversight is the lack of a median combine, which is very useful in reducing noise and there appears to be no way to make mosaics of several images to produce a wide field image.

should scale the dark frames to produce the lowest noise in the final image, but I found that I was able to consistently get better results with manual scaling.

The package offers some of the most sophisticated stretching methods available including the ability to draw your own histogram and use it to stretch the image. There is one very useful function missing, the ability to draw a custom transfer function as opposed to a histogram. This would allow the

of the box. The folks at Cyanogen Productions should be congratulated on an exceptional first release. I can think of no higher praise than I have spent my own money to purchase this package and am very satisfied with the product. Ω

SOLAR FLARE ALERT: BY HEATHER CAMERON

For the past four and a half years, I have been detecting solar flares by monitoring the D-layer of the ionosphere. This is done using my home-built, very low frequency (VLF) radio receiver which is tuned to 24 kHz transmitted by station NAA in Cutler, Maine (Cameron,1996, 1997). At 9:59 am DST on July 14, 1998, I detected an M 4.6 flare which just happens to be the largest flare I have detected since I started monitoring the D-layer. I confirmed this flare signal with solar geophysical data from the Solar Terrestrial Dispatch in Sterling, Alberta. A solar flare is a burst of extremely high energy from the surface of the Sun that is usually associated with sunspots. Solar flares produce more X-ray and UV radiation than the normal radiation from our Sun. These bursts of energy reach Earth in about 8.3 minutes and increase the ionization of nitrogen and oxygen atoms and molecules in Earth's ionosphere. Charged particles are also emitted from solar flares and travel faster than normal on the solar wind reaching Earth one or two days after the solar flare, producing geomagnetic storms and aurorae. The charged particles from flares can also damage Earth-orbiting



A full range of image calibration functions is supported with the option to average several calibration frames just by selecting multiple files. Dark frames can also be bias corrected during the calibration allowing the same dark frames to be used for varying exposures. There is an automatic scaling function built into the calibration routines that

user to selectively control the brightness of various areas of the image. I know that this can be done with the histogram specification, but the transfer function model is much easier to use and comprehend.

All in all MaxIm DL is an excellent image processing package; it is easy to use and provides stunning results right out



satellites. Solar-flare induced ionization of the ionosphere, geomagnetic storms and aurorae often alter or disrupt radio signals and communication, especially high frequency (HF) radio signals at high latitudes. The greater intensity of X-ray and UV radiation emitted by a flare can also harm astronauts in space and, as I have actually measured at ground level, increase the amount of UV that reaches Earth's surface. Solar flares are ranked into five categories according to their strength of soft X ray emissions (0.1 to 0.8 nm). Each class is ten times stronger than the previous one. The classes are, from lowest to highest, A, B, C, M, and X, which vary from 10^{-7} to 10^{-8} W/m, respectively, at Earth's orbit. The M 4.6 flare means that 4.6×10^{-4} W/m reach Earth's upper atmosphere. The area of the M 4.6 flare on the photosphere of the Sun was between 300 and 750 million square kilometres and gave off the equivalent of enough energy in just a few moments to supply all the energy needs of Canada for up to ten years (Taylor, 1991). Now that we have started to go

into sunspot cycle 23 we will observe more activity on the Sun and thus the frequency and size of solar flares will increase so keep that sun screen handy!

Cameron, Heather, 1996, Solar Observation Station: I.A.P.P.P. C communications No. 3, p. 1-39, 1997.

To the Sun and Back: Proceedings of the Astronomical League Convention, p. 44-55.

Phillips, K. J. H., 1992, Guide to the Sun, Cambridge University Press, New York, xiv & 386 p.

Taylor, Peter O., Observing the Sun, Cambridge University Press, New York, xiii & 59 Ω

**WHAT'S UP:
BY MIKE BOSCHAT**

September

Sat.12 - Aldebaran (Alpha Tauri) 0.3 degrees South of Moon. Occultation for Nova Scotia disappears at bright limb at: 0742

UT (4:42am) Reappears dark limb at: 0807 UT (5:07am).
Sat.19 - Zodiacal Light in East before the start of morning twilight for next 2 weeks.
Wed.23 - Equinox at 0537 UT (2:37am) - Autumn begins

October

Sun.4 - Jupiter is 0.2 degrees North of Moon at 0900 UT (6am).

Thur.8 - Draconid Meteor Shower peaks at 2100 UT (6pm). Irregular numbers, 1000 per hour, but possible dying shower.

Fri.9 - Aldebaran (Alpha Tauri) 0.4d South of Moon at 1600 UT (1 pm).

Thur.15 - Regulus (Alpha Leo) 0.5 degrees North of Moon at 1700 UT (2pm).

Fri.16 - Mars 1 degree North of Moon at 0400 UT (1am).

Mon.19 - zodiacal Light seen in morning twilight for next 2 weeks.

Sun.25 - Daylight Savings Time Ends Yeah!!

Sat.31 - Jupiter 0.2 degrees North of Moon at 1600 UT (noon)

Planet Roundup

Mercury: Early Sept visible low in east, lost after that.

Venus: Not visible.

Mars: By end Sept rises 3.5h
before Sun, and near 2am in Oct.

Jupiter: Well up in evening
skies.

”

Saturn: Same as Jupiter, rises
after sunset. Ω

NOTICE OF MEETINGS AND EVENTS

REGULAR MEETINGS

Date: **Regular Meeting — Friday, September 18 at 8pm**; 7pm for the council meeting.

Place: Lower Theater, Nova Scotia Museum of Natural History, Summer Street, Halifax. Access is from the parking lot.

Topic: **Main Speaker:** Dr. David Turner, Saint Mary's University
Topic: **"A Lifetime of Star Clusters"**

Date: **Regular Meeting — Friday, October 16 at 8pm**; 7pm for the council meeting.

Place: Lower Theater, Nova Scotia Museum of Natural History, Summer Street, Halifax. Access is from the parking lot.

Topic: **Main Speaker:** Pat Kelly of Daltech.
Topic: **Lost Oceans of Venus?**

BECOME A ST. CROIX OBSERVATORY KEY HOLDER

For a modest key fee, members in good standing for more than a year who have been briefed on observatory can gain access to the centre's new Observatory, which is nearing completion. To become a key holder, contact Observatory Committee Chair, Shawn Mitchell.

JUST WHERE IS THE ST. CROIX OBSERVATORY?

The Centre's Observatory is located in the community of St. Croix, Nova Scotia. To get there from Halifax (Bayers Road Shopping Centre), follow these simple instructions.

1. *Take Hwy 102 (the Bi-Hi) to Exit 4 (Sackville).*
2. *Take Hwy 101 to Exit 4 (St. Croix).*
3. *At the end of the off ramp, turn left.*
4. *Drive about 1.5km until you cross the St. Croix River Bridge. You will see a power dam on your left.*
5. *Drive about 0.2km past the bridge and take the first left (Salmon Hole Dam Road).*
6. *Drive about 1km until the pavement ends.*
7. *Drive another 1km on the dirt road to the site.*
8. *You will recognize the site by the two small white buildings on the left.*

SCIENTISTS AND INNOVATORS IN THE SCHOOLS

Are you interested in sharing your excitement for science with Nova Scotia students? We are presently seeking dynamic volunteer presenters who are keen to share their knowledge of astronomy and space.

Scientists and Innovators in the Schools provides a vital link between the education and the science communities by providing Nova Scotia classrooms with:

- Speakers and demonstrators
- Field trip leaders
- Science club advisors
- Science fair judges

For more information on being a role model to students in your community and on helping shape students' perceptions of careers in science and technology, contact:

Karen Rockwell
Scientists and Innovators in the Schools
Centre for Marine Geology, Dalhousie University
Halifax, N.S. B3H 3J5
494-2831 or outside Metro **1-800-565-SITS**
email: SITS@is.dal.ca

OVER DUE LIBRARY BOOKS

If you have had a Centre book out on loan for more than two months please return it to the library at the next Centre meeting, or if you need it longer for a project contact the Librarian.

1998 HALIFAX CENTRE EXECUTIVE

Honorary President	Clint Shannon	889-2426
President	Pat Kelly	798-3329
1st vice-president	Darren Talbot	443-9373
2nd vice-president	Mary Fraser	434-3103
Secretary	David Lane	826-7956
Treasurer	Shawn Mitchell	865-7026
Nova Notes Editor	David Lane	826-7956
National Representative	Greg Spearns	868-2626
Librarian	Mike Boschat	455-6831
Observing Chairman	Tony Jones	435-0535
Councilors	Steve Carrigan	479-0582
	Dave Chapman	463-9103

